

III.—On the Habits of the Orang-Utan of Borneo.

By ALFRED R. WALLACE.

THE two species of *Pithecus* which it is believed have now been proved to exist in Borneo, appear to have habits so similar that we shall not attempt to divide them, but shall speak of the *genus* in the following observations, in which we shall for brevity use the native name "Mias" as applied to both species.

There seems little reason to doubt that the Sumatran Orang is identical with the larger Bornean species, or that possessing the lateral cheek-ridges. All these animals confine themselves strictly to the low, level and swampy districts which occupy so large a portion of the surface of both these islands; and this circumstance sufficiently accounts for the peculiarity of their distribution. It seems at first sight surprising, that though they are abundant on almost all the north-west coast of Borneo, and in the south and south-west districts as far north as Sambas, yet in the territory of Sarawak they are quite unknown. But when we know the habits of the animal, we see a sufficient reason for this in the peculiar physical features of the Sarawak district. The Mias frequents those districts only which are so low and level as to be marshy, and are at the same time covered with a lofty virgin forest. In the midst of these plains are isolated mountains, on many of which the Dyaks have settled and planted numerous fruit-trees, which are much sought after by the Mias, which traverses these hills in all directions, but always retires to the swamp at night. Wherever the country becomes slightly elevated, and therefore dry, the Mias is no longer found. Thus, in the lower part of the Sadong River the Mias is abundant; but immediately above the limit of the tides, where the country, though still flat, is just high enough to be dry, it disappears. Now the Sarawak valley has this peculiarity, that the lower portion, though swampy, is not covered with continuous lofty forest, but is principally occupied by the Nipa palm, while at a short distance above the town of Sarawak the country becomes dry and covered with low undulations, the greater portion of which is second-growth jungle, having been at different times cultivated by the Malays and Dyaks. It is probably the vast extent of unbroken and equally lofty forest which is the principal attraction to the Mias. These forests are its open country, the place best adapted to its mode of life, where it can roam in every direction with as much facility as the Indian in the prairie or the Arab in the desert. The dry grounds are more frequented by man, more cut up by clearings and by low second-growth jungle, in which progression is more difficult,

where it is more exposed to danger, and where probably its favourite food is less abundant.

It is a singular and most interesting sight to watch a Mias making his way leisurely through the forest. He walks deliberately along the branches, in the semi-erect attitude which the great length of his arms and the shortness of his legs give him: choosing a place where the boughs of an adjacent tree intermingle, he seizes the smaller twigs, pulls them towards him, grasps them, together with those of the tree he is on, and thus, forming a kind of bridge, swings himself onward, and seizing hold of a thick branch with his long arms, is in an instant walking along to the opposite side of the tree. He never jumps or springs, or even appears to hurry himself, and yet moves as quickly as a man can run along the ground beneath. When pursued or attacked, his object is to get to the loftiest tree near; he then climbs rapidly to the higher branches, breaking off quantities of the smaller boughs, apparently for the purpose of frightening his pursuers. Temminck denies that the Orang breaks the branches to throw down when pursued; but I have myself several times observed it. It is true he does not throw them *at* a person, but casts them down vertically; for it is evident that a bough cannot be thrown to any distance from the top of a lofty tree. In one case, a female Mias, on a durian tree, kept up for at least ten minutes a continuous shower of branches and of the heavy spined fruits, as large as 32-pounders, which most effectually kept us clear of the tree she was on. She could be seen breaking them off and throwing them down with every appearance of rage, uttering at intervals a loud pumping grunt, and evidently meaning mischief.

When a Mias is once up a lofty tree, there is no danger of his getting away, as he will not descend to the lower branches, which he must do to pass to another tree. As soon as he feels himself badly wounded he makes a nest, which, if he completes, is so secure that he will never fall from it. I lost two Miasas that way, both dying on their nest, when I could not get any one to climb up or cut down the tree till the next day, when putrefaction had commenced. They choose a horizontal forked branch, and breaking off all the branches in its neighbourhood, lay them across one another till a complete leafy bed is made, which quite hides them from below, and from which they will not move afterwards. Their tenacity of life is very great,—from six to a dozen bullets in the body being required to kill them, or make them fall.

Every night the Mias sleeps on a nest similar to that above described, but smaller, and generally placed on a small tree, not more than 50 or 60 feet from the ground. The same animal

appears seldom to use these nests more than once or twice, and they are accordingly very abundant in places frequented by the Mias. They feed all through the middle of the day, but seldom return to the same tree two days running. They seem not much alarmed at man, often staring down upon me for several minutes, and then moving away slowly to a short distance. After seeing one, I have often had to go a mile or more to fetch my gun, and in almost every case have found it on my return within a hundred yards of the place. I have never seen two adult animals together; but both males and females are sometimes accompanied by half-grown young ones, or two or three of the latter go in company. They very rarely descend to the ground,—probably only in search of water.

The females have but one young, which clings by the long hair of its mother's flanks, and so little impedes her motions, that in two cases I was not aware of its presence till both fell together. The food of the Mias consists exclusively of fruits, with occasionally, when these are scarce, tender shoots and leaves. They seem to prefer them unripe, and many are intensely bitter, particularly the large red fleshy arillus of one fruit, which seems an especial favourite. In another case, they eat only the small seed of a large fruit, of which they destroy immense quantities. The durian (*Durio zibethinus*) is also a great favourite, and the Mias destroys large quantities of this delicious fruit, in places where it grows surrounded by lofty jungle, but will not pass over clearings to get at them. It seems wonderful how the animal can tear open this fruit, the outer covering of which is so thick and tough, and densely covered with strong conical spines. It probably bites a few of these off first, and then, making a small hole, tears the fruit open with its powerful fingers.

It has been said, that the huge canine teeth of the Orang are for the purpose of defending himself against the tigers, bears, and other carnivorous animals of the Eastern forests. Our observations and inquiries as to the habits of the animal convince us, however, that no such explanation of this part of the animal's structure is at all satisfactory. In the first place, neither the tiger nor any other of the large carnivora are found in Borneo, where the Orang is most abundant; though in Sumatra the tiger and the Mias are found together. In the second place, the tiger cannot climb trees, and is therefore quite unable to attack the Orang, which never need descend to the ground, and very rarely does so. The Malayan Bear (*Helarctos Malayanus*) is the only animal which would have any chance whatever in attacking him; but as it is not carnivorous (or but slightly so), it could have no object in commencing an attack in which it

would probably be beaten. The Dyaks are unanimous in their statements that the Mias never either attacks or is attacked by any animal, with one exception, which is highly curious, and would hardly be credible were it not confirmed by the testimony of several independent parties, who have been eye-witnesses of the circumstance. The only animal the Mias measures his strength with is the Crocodile of these regions (*Crocodilus biporcatus*?). The account of the natives is as follows:—"When there is little fruit in the jungle, the Mias goes to the river-side to eat the fruits that grow there, and also the young shoots of some palm-trees which are found at the water's edge. The crocodile then sometimes tries to seize him, but he gets on the reptile's back, beats it with his hands and feet on the head and neck, and pulls open its jaws till he rips up the throat. The Mias always kills the crocodile, for he is very strong. There is no animal in the jungle so strong as he."

Now it is very important to observe, that in this, the only case in which the Mias has to defend himself against a formidable attack, he never uses his teeth at all! He depends solely upon the immense strength of his arms. But even if we suppose that in Sumatra he is sometimes exposed to the attacks of the tiger, does any one imagine for a moment that his teeth would be of the slightest use to him? The tiger always attacks unawares, and almost always from behind. Let us imagine, then, a tiger springing upon the back of an Orang who was walking upon the ground; what could the animal possibly do, with those fearful claws deep in his back and shoulders, and those tremendous teeth firmly fastened in his neck? The vertebræ would probably be broken, and the Mias would fall dead on the spot, as almost every animal does under such an attack; more especially as the tiger, knowing the strength of its prey, would be sure to strike at a mortal part, or obtain such a hold as could not be shaken off. But there is yet another consideration, which shows that the canines of the Orang can hardly have been given it for the purpose of enabling it to defend itself against its enemies. The females have very small canines, and comparatively weak jaws; and as they, when suckling young ones, require defence far more than the males, who are so much more powerful, the same weapons would hardly have been denied them. It may be objected, that they would be guarded by the males; but this cannot be the case, because the females with young are always found alone, and the adult males also by themselves, as is the case with many other animals.

Here then we have an animal which lives solely and exclusively on fruits or other soft vegetable food, and yet has huge canine teeth. It never attacks other animals, and is rarely attacked

itself; but when it is, it uses, not these powerful teeth, but its arms and legs to defend itself. And, lastly, the female, which is weaker, which is encumbered by its young, and which would therefore afford a much easier prey, and a more tempting object of attack, is quite unprovided with these supposed means of defence. Do you mean to assert, then, some of my readers will indignantly ask, that this animal, or any animal, is provided with organs which are of no use to it? Yes, we reply, we do mean to assert that many animals are provided with organs and appendages which serve no material or physical purpose. The extraordinary excrescences of many insects, the fantastic and many-coloured plumes which adorn certain birds, the excessively developed horns in some of the antelopes, the colours and infinitely modified forms of many flower-petals, are all cases, for an explanation of which we must look to some general principle far more recondite than a simple relation to the necessities of the individual. We conceive it to be a most erroneous, a most contracted view of the organic world, to believe that every part of an animal or of a plant exists solely for some material and physical use to the individual,—to believe that all the beauty, all the infinite combinations and changes of form and structure should have the sole purpose and end of enabling each animal to support its existence,—to believe, in fact, that we know the one sole end and purpose of every modification that exists in organic beings, and to refuse to recognize the possibility of there being any other. Naturalists are too apt to *imagine*, when they cannot *discover*, a use for everything in nature: they are not even content to let “beauty” be a sufficient use, but hunt after some purpose to which even *that* can be applied by the animal itself, as if one of the noblest and most refining parts of man’s nature, the love of beauty for its own sake, would not be perceptible also in the works of a Supreme Creator*.

* The talented author of the ‘Plurality of Worlds’ has some admirable remarks on this subject. He says, “In the structure of animals, especially that large class best known to us, vertebrate animals, there is a general plan, which, so far as we can see, goes beyond the circuit of the special adaptation of each animal to its mode of living; and is a rule of creative action, in addition to the rule that the parts shall be subservient to an intelligible purpose of animal life. We have noticed several phænomena in the animal kingdom, where parts and features appear rudimentary and inert, discharging no office in their œconomy, and speaking to us not of purpose, but of law.” Again: “And do we not, in innumerable cases, see beauties of colour and form, texture and lustre, which suggest to us irresistibly the belief that beauty and regular form are rules of the creative agency, even when they seem to us, looking at the creation for uses only, idle and wanton expenditure of beauty and regularity? To what purpose are the host of splendid circles which decorate the tail of the peacock, more beautiful, each of them, than Saturn and his rings? To what purpose the

The separate species of which the organic world consists being parts of a whole, we must suppose some dependence of each upon all; some general design which has determined the details, quite independently of individual necessities. We look upon the anomalies, the eccentricities, the exaggerated or diminished development of certain parts, as indications of a general system of nature, by a careful study of which we may learn much that is at present hidden from us; and we believe that the constant practice of imputing, right or wrong, some use to the individual, of every part of its structure, and even of inculcating the doctrine that every modification exists solely for some such use, is an error fatal to our complete appreciation of all the variety, the beauty, and the harmony of the organic world.

It is a remarkable circumstance, that an animal so large, so peculiar, and of such a high type of form as the Orang-Utan, should yet be confined to such a limited district,—to two islands, and those almost at the limits of the range of the higher mammalia; for, eastward of Borneo and Celebes, the *Quadrumana* and most of the higher mammalia almost disappear. One cannot help speculating on a former condition of this part of the world which should give a wider range to these strange creatures, which at once resemble and mock the “human form divine,”—which so closely approach us in structure, and yet differ so widely from us in many points of their external form. And when we consider that almost all other animals have in previous ages been represented by allied, yet distinct forms,—that the bears and tigers, the deer, the horses, and the cattle of the tertiary period were distinct from those which now exist, with what intense interest, with what anxious expectation must we look forward to the time when the progress of civilization in those hitherto wild countries may lay open the monuments of a former world, and enable us to ascertain approximately the period when the present species of Orangs first made their appearance, and perhaps prove the former existence of allied species still more gigantic in their dimensions, and more or less human in their form and structure! Some such discoveries we may

exquisite textures of microscopic objects, more curiously regular than anything which the telescope discloses? To what purpose the gorgeous colours of tropical birds and insects, that live and die where human eye never approaches to admire them? To what purpose the thousands of species of butterflies, with the gay and varied embroidery of their microscopic plumage, of which one in millions, if seen at all, only draws the admiration of the wandering schoolboy? To what purpose the delicate and brilliant markings of shells which live generation after generation in the sightless depths of ocean? Do not all these examples, to which we might add countless others, prove that beauty and regularity are universal features of the work of Creation in all its parts, great and small?”

not unreasonably anticipate, after the wonders that geology has already made known to us. Animals the most isolated in existing nature have been shown to be but the last of a series of allied species which have lived and died upon the earth. Every class and every order has furnished some examples, from which we may conclude, that all isolations in nature are apparent only, and that whether we discover their remains or no, every animal now existing has had its representatives in past geological epochs.

IV.—*Polyzoa collected by Mr. M'Andrew on the Coast of Norway and Finmark in 1856.* By GEORGE BUSK, F.R.S. & L.S.*

[With a Plate.]

MOLLUSCA.

Class POLYZOA.

Order I. P. INFUNDIBULATA.

Suborder I. Cheilostomata.

1. Fam. CABEREADÆ, Busk (*B. M. Cat.* p. 37).

1. *Caberea*, Lamx. (*B. M. Cat.* p. 37).

1. *C. Hookeri*, Fleming (*B. M. Cat.* p. 39. pl. 38. fig. 2).

2. Fam. CELLEPORADÆ, Busk (*B. M. Cat.* p. 85).

1. *Cellepora*, O. Fabricius (*B. M. Cat.* p. 85).

1. *C. cervicornis*, auctor. (pars); Couch, Cornish Fauna, p. 111, pl. 19. (Pl. I. fig. 1.)

Much confusion exists with respect to this species, which I have no doubt more properly belongs to *Eschara*. The form here intended, however, which is plainly identical with Mr. Couch's, and therefore most probably with Borlase's, is quite distinct from the *Eschara cervicornis* of the *B. M. Cat.*, and I believe also from that of M.-Edwards (*Sur les Eschares*, p. 15. pl. 1. fig. 1), though perhaps not from the form represented in his pl. 2. fig. 1. The genus *Eschara* requires careful revision, as does also *Cellepora*.

* The list is arranged according to the artificial classification adopted in my Catalogue of Marine Polyzoa published by the British Museum, in which, so far as that Catalogue at present extends, the synonymy will be found.